AMENDMENTS TO THE CLAIMS:

1. (Previously presented) An equalizer for equalizing a detection signal obtained by detecting a reception signal at an oversampling rate, said reception signal periodically including known symbol patterns made up of at least one symbol, said equalizer comprising:

symbol pattern synchronizing means for reproducing symbol timing by detecting said symbol patterns based on said reception signal at the oversampling rate;

equalizing means for acquiring an equalized signal by multiplying signals extracted from said reception signal at predetermined intervals of n samples and weights;

symbol pattern generating means for generating a reference signal equal to said symbol patterns;

error calculating means for acquiring an equalization error by subtracting said equalized signal from said reference signal; and

weight updating means for updating said weights based on said detection signal and said equalization error at the timing of said symbol patterns.

2. (Previously presented) The equalizer according to claim 1, wherein said reception signal is demodulated with QAM, said symbol patterns consisting of not more than 4 symbols having maximum values in both of I and Q phases in the QAM symbol mapping, said weight updating means updates said weights using a Least Mean Square algorithm.

3. (Currently amended) A receiver for carrying out diversity receiver for a reception signal at an oversampling rate, said reception signal periodically including known symbol patterns made up of at least one symbol, said receiver comprising:

a plurality of antennas for receiving said reception signal;

a plurality of detecting means for carrying out quadrature detection on the reception signals from said corresponding antennas;

a plurality of equalizers for carrying out equalization using the outputs of said corresponding detecting means;

selecting means for selecting the outputs of said plurality of equalizers;

data decision means for deciding data based on the output of said selecting means,

wherein each of said plurality of equalizers comprises:

symbol pattern synchronizing means for reproducing symbol timing by detecting said symbol patterns based on the output signals of said detecting means ~~said reception signal~~ at the oversampling rate;

equalizing means for acquiring an equalized signal by multiplying signals extracted from the output signals of said detecting means ~~said reception signal~~ at predetermined intervals of n samples and weights;

symbol pattern generating means for generating a reference signal equal to said symbol patterns;

error calculating means for acquiring an equalization error by subtracting said equalized signal from said reference signal; and

weight updating means for updating said weights based on the output signals of said detecting means ~~said detection signal~~ and said equalization error at the timing of said reproduced symbol timing~~patterns~~.

4. (Canceled).

5. (Currently amended) A receiver for carrying out diversity receiver for a reception signal at an oversampling rate, said reception signal periodically including known symbol patterns made up of at least one symbol, said apparatus comprising:

a plurality of detecting means for carrying out quadrature detection on the reception signals from said corresponding antennas;

symbol pattern synchronizing means for reproducing symbol timing by detecting said symbol patterns based on the output signals of said detecting means ~~said reception signal~~ at the oversampling rate;

a plurality of ~~at least one~~ equalizing means for acquiring equalized signals by multiplying signals extracted from the outputs of said corresponding detecting means ~~said reception signal~~ at predetermined intervals of n samples and weights;

combining means for combining the outputs of said plurality of equalized signals;

symbol pattern generating means for generating a reference signal equal to said symbol patterns;

error calculating means for acquiring an equalization error by subtracting said equalized signal from said reference signal;

a plurality of ~~at least one~~ weight updating means for updating each weight ~~weights~~ based on the output signals of said detecting means ~~said corresponding detection signals~~ and said corresponding equalization errors at the timing of said symbol patterns; and

data decision means for deciding data based on the output of said combining means.

6. (Canceled).

7. (Previously presented) The receiver according to claim 3, wherein equalization processing is carried out based on weights updated when the synchronization position of said

detection signal is detected, whereas equalization processing is carried out without weight updating when the synchronization position of said detection signal is not detected.

8. (Canceled).

9. (Currently amended) A reception method for carrying out diversity receiver for a reception signal at an oversampling rate, said reception signal periodically including known symbol patterns made up of at least one symbol, said method comprising:

a reception step of receiving said reception signal by a plurality of antennas;

a detecting step of carrying out quadrature detection on received signals from said corresponding antennas using a plurality of detecting means;

a plurality of equalizing steps of carrying out equalization using the outputs of said corresponding detecting means ~~said reception signal~~ at the oversampling rate;

a selecting step of selecting processing results obtained by said plurality of equalizing steps corresponding to said plurality of detecting means; and

a deciding step of deciding data based on said selected processing result;

wherein each of said plurality of equalizing steps comprises:

a step of equalizing a detection signal obtained by said detecting step~~detecting a reception signal at the oversampling rate~~, said reception signal periodically including known symbol patterns made up of at least one symbol; and

a step of detecting a symbol synchronization position by detecting said symbol patterns based on the outputs of said corresponding detecting means ~~said reception signals~~ at the oversampling rate,

wherein each equalizing step ~~equalization processing~~ is carried out based on weights updated when the synchronization position of said detection signal is detected,

whereas said equalizing step ~~equalization processing~~ is carried out without weight updating when the synchronization position of said detection signal is not detected.

10-12. (Canceled).

13. (Currently amended) A reception method for carrying out diversity receiver for a reception signal with periodically inserted known symbol patterns made up of at least one symbol, said method comprising:

a step of receiving said reception signal by a plurality of antennas;

a step of carrying out quadrature detection on received signals from said corresponding antennas using a plurality of detecting means;

a step of detecting a symbol synchronization position by detecting said symbol pattern based on said reception signals output from said plurality of detecting means; and

a step of equalizing a detection signal obtained by said detecting step using weights at predetermined interval of n samples,

wherein said equalizing step ~~equalization processing~~ is carried out based on weights respectively updated when the synchronization position of said detection signal is detected, whereas said equalizing step ~~equalization processing~~ is carried out without updating of respective weights and the respective outputs of said equalizing step ~~equalization processing~~ are combined with each other when the synchronization position of said detection signal is not detected.

14. (Original) The reception method according to claim 13, wherein said weight updating is carried out using an error power minimizing algorithm.

15. (Previously presented) The equalizer according to claim 1, wherein the equalizing means comprises:

a first, a second, and a third complex weight multiplier unit; and

an adder unit,

wherein the adder unit outputs a result of adding up signals output from the first, the second, and the third complex weight multipliers as an equalization output G(t),

wherein the equalization output G(t) is expressed by:

$$G(t)=W0 \bullet R(t)+W1 \bullet R(t-nT) + W2 \bullet R(t-2nT) \quad (1).$$

16. (Previously presented) The equalizer according to claim 15, further comprising:

a first and a second n-sample delay unit,

wherein said first n-sample delay unit outputs a first signal to the second n-sample delay unit and the second complex weight multiplier, and

wherein said second n-sample delay unit outputs a second signal to the third complex weight multiplier.

17. (Previously presented) The equalizer according to claim 1, wherein the equalizing means comprises:

a first and a second n-sample delay unit;

a first, a second, and a third complex weight multiplier unit; and

an adder unit,

wherein said first n-sample delay unit outputs a first signal to the second n-sample delay unit and the second complex weight multiplier,

wherein said second n-sample delay unit outputs a second signal to the third complex weight multiplier,

wherein the first complex weight multiplier outputs a third signal to the adder unit,

wherein the second complex weight multiplier outputs a fourth signal to the adder unit,

wherein the third complex weight multiplier outputs a fifth signal to the adder unit,

wherein the adder unit outputs a result of adding up the third signal, and the fourth signal, and the fifth signal output from the first, the second, and the third complex weight multipliers as an equalization output G(t) to a data decision circuit and a subtracter unit, and

wherein the equalization output G(t) is expressed by:

$$G(t)=W0 \bullet R(t)+W1 \bullet R(t-nT) + W2 \bullet R(t-2nT) \quad (1).$$

18. (Previously presented) The equalizer according to claim 1, wherein the equalizing means comprises:

a first and a second n-sample delay unit;

a first, a second, and a third complex weight multiplier unit; and

an adder unit,

wherein a digitized quadrature detection I/Q signal is represented by R(t),

wherein said first n-sample delay unit outputs R(t-nT), which is a result of delaying R(t) by nT, to the second n-sample delay unit and the second complex weight multiplier,

wherein T denotes an A/D converted 1-sample time,

wherein the second n-sample delay unit outputs R(t-2nT), which is a result of delaying R(t-nT) by nT to the third complex weight multiplier,

wherein the first complex weight multiplier outputs W0 • R(t), which is a result of multiplying R(t) by the complex weight W0 from a weight control circuit to the adder unit,

wherein the second complex weight multiplier outputs W1 • R(t-nT), which is a result of multiplying R(t-nT) by the complex weight W1 from the weight control circuit to the

adder unit while the third complex weight multiplier outputs W2 • R(t-2nT), which is a result of multiplying R(t-2nT) by the complex weight W2 from the weight control circuit to the adder unit,

wherein the adder unit outputs a result of adding up outputs from the first, second, and third complex weight multipliers as an equalization output G(t) to a data decision circuit and a subtracter unit, and

wherein the equalization output G(t) is expressed by:

$$G(t)=W0 \bullet R(t)+W1 \bullet R(t-nT) + W2 \bullet R(t-2nT) \quad (1).$$

19. (Previously presented) The equalizer according to claim 18, wherein the data decision circuit outputs a value closest to the equalization output G(t) of a transmission QAM symbol mapping values as demodulated data to an outside at a symbol timing from a frame/symbol synchronization circuit.

20. (Previously presented) The equalizer according to claim 1, wherein said symbol pattern generating means outputs only one of 16QAM symbols mapping values for said symbol patterns.